Scientific Papers. Series D. Animal Science. Vol. LIX, 2016
ISSN 2285-5750; ISSN CD-ROM 2285-5769; ISSN Online 2393-2260; ISSN-L 2285-5750

ECONOMIC EFFICIENCY - A KEY TO BIODIVERSITY CONSERVATION. ANALYZE PRODUCT COST STRUCTURE AND PROFIT CALCULATION IN THREE TYPES OF BUFFALO FARMS IN FAGARAS AREA

Răzvan Alexandru POPA[1], Livia VIDU[1], Dana Cătălina POPA[1], Adrian BOTA[2]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania
[2]Research and Development Station for Buffaloes Breeding of Șercaia, 2 Câmpului Street, Șercaia, Brașov County, Romania

Corresponding author email: poparasvan@yahoo.co.uk

Abstract

The work aims to study the economic status of some buffalo farms in Fagaras Area. These information are absolutely necessary for developing a program for active conservation of Indigenous Romanian Buffalo. Biological and economic efficiency is an objective of any farm to obtain expected benefits. Lower production costs are a goal of all producers in the field. In accordance with the purpose, they were followed two aspects: study the influence of farm size on parameters that influence production costs and economic efficiency of the unit; to establish to what extent the economic efficiency of the farm is influenced by how the production is harnessed. Whatever the size of the farm, milk and Telemea cheese are produced under conditions of total economic inefficiency. It appears advisable to increase the global production of milk at the farm level. Increasing the volume and quality of milk production and diversification of products offered for sale are efficient ways to minimize the cost per unit of product. Diversification of production at farm level should be a strategic objective of buffaloes exploitation in Romania in order to preserve the genetic resources and biodiversity.

Key words*: buffaloes, biodiversity conservation, economic efficiency, cost structure.*

INTRODUCTION

Current concerns for halting the loss of biodiversity are justified by the enormous rate with which it is lost, being in real danger of extinction entire categories of its components. Biodiversity is under unprecedented threat due to human pressure (Cogălniceanu, 1999).

In animal husbandry, conservation of biodiversity appears nowadays as a necessity because intensification of farming has led to the imposition of certain breeds exploitation and exclusion of others. As a result, some of them have become cosmopolitan and others have disappeared or have entered into an unprecedented numerical decline.

Economic inefficiency is the main factor favoring the decline or disappearance of domestic animal populations. As a result of this, populations either has suffered continuous numeric decreases to a size that determined entered in genetic drifting, or were subject of absorption (Popa, 2009).

Bringing vulnerable species or breeds to the attention of breeders, change selection objective, increasing economic efficiency to increase competitiveness in the natural life, are paths for specific and genetic biodiversity conservation (Grosu, 2003). In order to develop such programs are necessary analyzes of the concrete situation in growth area. In this context, the work aims to study the economic status of some buffalo farms in Fagaras Area. This information is absolutely necessary for developing a program for active conservation of Indigenous Romanian Buffalo. Biological and economic efficiency is an objective of any farm to obtain expected benefits. Lower production costs are a goal of all producers in the field.

In accordance with the purpose, they were followed two aspects: study the influence of farm size on parameters that influence production costs and economic efficiency of the unit; to establish to what extent the economic efficiency of the farm is influenced by how the production is harnessed.

MATERIALS AND METHODS

The research was conducted based on a questionnaire that was distributed via Buffaloes Breeders Association of Romania, headquartered in Şercaia, Brasov County. It aimed to identify at the farmers in Fagaras/Şercaia, the size of conventional farms, herd structure, associated costs and the main categories of incomes by capitalizing production. Based on information from these questionnaires, it was tried to simulate farm modules that correspond as closely as reality in the field.

Evaluation of production unit costs for each of the studied variants (determined by analyzing of questionnaires) was made based on the classification of expenses into two categories: fixed expenses and variable expenses (Oancea, 1999). In this way, the costs per unit of product were quantified by determining the unit cost of production, the latter in his turn is made up of fixed unit cost and unit cost variable.

In the category of fixed costs were not taken into account leaseholds, rents, interest on credits, various types of insurance, depreciation of fixed capital, some of the common and general expenses. In the analyzed farms, these categories of expenses are not included. In the category of fixed costs we consider for our analysis only on those associated with permanent staff.

In the variable expenses, to determine their level, they were established following feed prices (note that all categories of feed are produced under own):

- 0.08 lei per kg green grass forage;
- 0.25 lei per kg silage;
- 0.5 lei per kg hey (hill's hey);
- 0.4 lei per kg coarsely forage (harvest straw, etc.);
- 1 lei per kg concentrated feed mixture.

Also, although we were not given such expenditures, their lack we consider negligence or incapacitated/unable of farmers evaluation. Therefore, we appreciate in the determination of cost structure, an average price of 50 lei/head/year costs associated with veterinary care (including preventive treatment, curative, mandatory review).

From analysis of the questionnaires, the majority of buffalo farms are subsistence farms, with an average of 5 milk females per farm, plus a few heads of youth and one bull. However, during the research, were noted two larger units, one located in the Arpaşu de Sus village (Dan Cristian Naucsi owner) and the other in Grid village (owner Victor Draghici). We analyze the cost of production for each of the two, to which we add a third type, subsistence farm environment respectively, which prevailing in the Şercaia.

RESULTS AND DISCUSSIONS

A. Farm owned by Naucsi Dan Cristian, located in Arpaşu de Sus, is considered to be a big size one (over 20 heads). Table 1 presents the herd structure as it was indicated to us by the owner.

Table 1. Herd structure in farm owned by Naucsi Dan Cristian, located in Arpaşu de Sus

Animal category	Number of heads
Female buffaloes for milk	46
Heifers	28
Bulls	2
Female youth 0-3 months	10
Male youth 0-3 months	25
Female youth 3-6 months	10
Male youth 3-6 months	10
Female youth over 6 months	10
Youth male for fattening (over 6 months)	8

As indicated in the questionnaire, owner of the farm has 4 employees, 2 tractor drivers and two animal caretakers, with 1100 lei net pay each month. Because the employee is paid monthly with such an amount, the employer spends 1876 lei/month (according to legal regulations in force at the time of the research). Table 2 and Figure 1 present the production cost structure of the products produced on the analyzed farm.

Table 2. Production cost structure of the products produced in farm owned by Naucsi Dan Cristian, located in Arpaşu de Sus

Specification	Lei	Structure (% of total)
Fixed expenses	90048	26.29
Staff expenses	90048	26.29
Variable expenses	252441	73.71
Expenses for electricity	3600	1.05
Fuel expenses	6000	1.75
Expenses for feed	235391	68.73
Expenses for water	0	0.00
Veterinary assistance expenses	7450	2.18
Supply and transportation expenses	0	0.00
TOTAL EXPENSES	342489	100.00

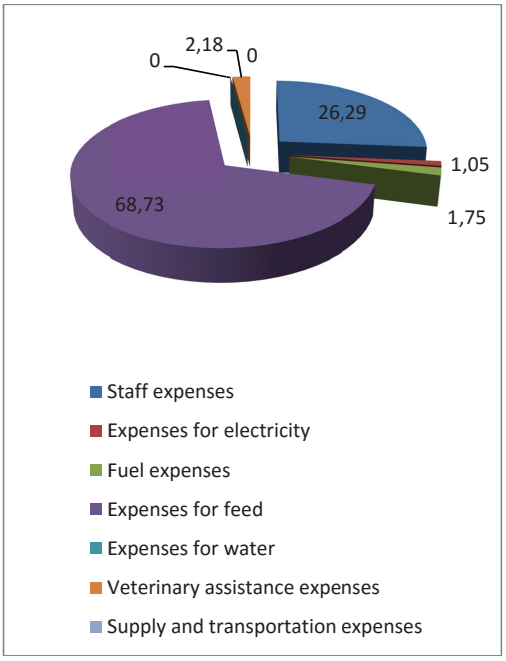

Figure 1. Production cost structure of the products produced in farm owned by Naucsi Dan Cristian, located in Arpaşu de Sus

Estimated production costs on the analyzed farm are:

1. Fixed unit cost:

$$C_{uf} = \frac{Fixed\ expenses}{Production\ volume} = \frac{90048}{36500} = 2.467\ lei\ per\ milk\ liter$$

2. Variable unit cost:

$$C_{uv} = \frac{Variable\ expenses}{Production\ volume} = \frac{252441}{36500} = 6.916\ lei\ per\ milk\ liter$$

3. Total unit cost:

$$C_{ut} = \frac{Production\ expenses}{Production\ volume} = \frac{342489}{36500} = 9.383\ lei\ per\ milk\ liter$$

We present in Table 3 profit calculation for analyzed farm.

It is observed so those, for one liter of milk, are necessary expenses amounting to 9.38 lei. It highlights the very high proportion of feed costs in total expenses for one liter of milk (68.73%) and the large share of staff expenses by 26.29% from total.

As stated in the questionnaire, the owner of analyzed farm deliver daily 50 liters of milk to a processing unit at a price of 3 lei/liter and 50 liters is processing the cheese, within his own farm, which capitalizes 15 lei/kg.

Table 3. Profit calculation in farm owned by Naucsi Dan Cristian, located in Arpaşu de Sus

INCOMES	✓ Milk for sale: 18250 liters x 3 lei/liter = 54750 lei/year ✓ Telemea Cheese: 4562,5 kg x 15 lei/kg = 68437.5 lei/year ✓ Subsidies: - 46 female for milk x 1393 lei/head = 64078 lei/year - 103 heads (others categories) x 575 lei/head = 59225 lei/year
	TOTAL INCOMES: 246490.5 lei/year
EXPENSES	✓ Staff expenses: 90048 lei/year ✓ Expenses for electricity: 3600 lei/year ✓ Fuel expenses: 6000 lei/year ✓ Expenses for feed: 235391 lei/year ✓ Veterinary assistance expenses: 7450 lei/year
	TOTAL EXPENSES: 342489 lei/year
BENEFIT	-

As a result, it may be noted that the capitalization of production in the form of raw milk delivered to processing unit is economically inefficient. The production unit cost was more than 6 times higher than the selling price. Cheese processing within their own farm is also economically inefficient because, if the entire volume of production would be processed into cheese, the production unit cost would be 37.53 lei per kg.

Even taking into account subsidies cannot put into discuss the existence of any benefit.

B. Farm owned by Drăghici Victor, located in Grid village, is considered to be a big size one (over 20 heads). Table 4 present the herd structure as it was indicated to us by the owner.

Table 4. Herd structure in farm owned by Drăghici Victor, located in grid village

Animal category	Number of heads
Female buffaloes for milk	19
Heifers	1
Bulls	1
Female youth 0-3 months	3
Male youth 0-3 months	14
Female youth 3-6 months	-
Male youth 3-6 months	-
Female youth over 6 months	-
Youth male for fattening (over 6 months)	-

As indicated in the questionnaire, owner of the farm has 1 employee (animal caretakers), with 800 lei net pay each month. Because the employee is paid monthly with such an amount, the employer spends 1335 lei/month (according to legal regulations in force at the time of the research).

Table 5 and Figure 2 present the production cost structure of the products produced on the analyzed farm.

Table 5. Production cost structure of the products produced in farm owned by Drăghici Victor, located in Grid village

Specification	Lei	Structure (% of total)
Fixed expenses	16020	19.99
Staff expenses	16020	19.99
Variable expenses	64125	80.01
Expenses for electricity	960	1.20
Fuel expenses	5400	6.74
Expenses for feed	54525	68.03
Expenses for water	240	0.30
Veterinary assistance expenses	1200	1.50
Supply and transportation expenses	1200	1.50
Other expenses	600	0.75
TOTAL EXPENSES	80145	100.00

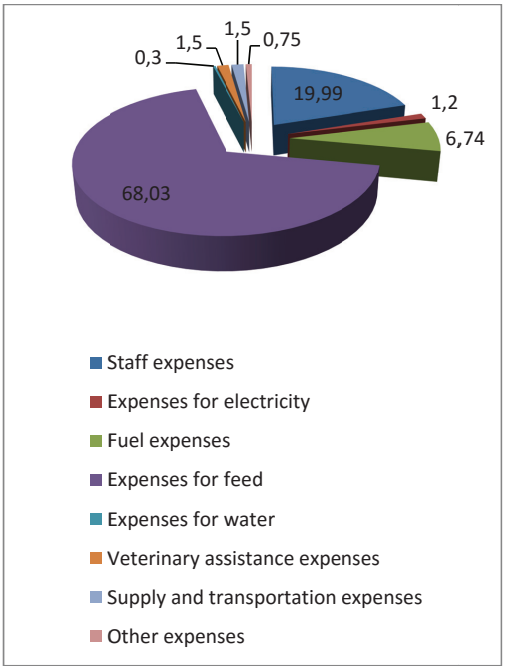

Figure 2. Production cost structure of the products produced in farm owned by Drăghici Victor, located in Grid village

Estimated production costs on the analyzed farm are:

1. Fixed unit cost:

$$C_{uf} = \frac{Fixed\ expenses}{Production\ volume} = \frac{16020}{12775} = 1.254\ lei\ per\ milk\ liter$$

2. Variable unit cost:

$$C_{uv} = \frac{Variable\ expenses}{Production\ volume} = \frac{64125}{12775} = 5.019\ lei\ per\ milk\ liter$$

3. Total unit cost:

$$C_{ut} = \frac{Production\ expenses}{Production\ volume} = \frac{80145}{12775} = 6.273\ lei\ per\ milk\ liter$$

We present in Table 6 profit calculation for analyzed farm.

Table 6. Profit calculation in farm owned by Drăghici Victor, located in Grid village

INCOMES	✓ Telemea cheese: 3193.75 kg x 15 lei/kg = 47906.25 lei/year ✓ Male youth: 14 heads x 800 lei/head = 11200 lei/year ✓ Subsidies: - 19 female for milk x 1393 lei/head = 26467 lei/year - 5 heads (other categories) x 575 lei/head = 2875 lei/year
	TOTAL INCOMES: 88448.25 lei/year
EXPENSES	✓ Staff expenses: 16020 lei/year ✓ Expenses for electricity: 960 lei/year ✓ Fuel expenses: 5400 lei/year ✓ Expenses for feed: 54525 lei/year ✓ Expenses for water: 240 lei/year ✓ Supply and transportation expenses: 1200 lei/year ✓ Veterinary assistance expenses: 1200 lei/year ✓ Other expenses: 600 lei/year
	TOTAL EXPENSES: 80145 lei/year
BENEFIT	Total income - total expenses = 8303.25 lei
PROFIT TAX	1328.52 lei
NET PROFIT	6974.73 lei

It is observed so that, for one liter of milk, are necessary expenses amounting to 6.273 lei. It highlights the very high proportion of feed costs in total expenses for one liter of milk (68.03%) and the large share of staff expenses by 20% from total.

As stated in the questionnaire, the owner of analyzed farm capitalizes the entire production of milk by processing in cheese, which sells for 15 lei/kg. Also it offered for sale 14 heads of youth male for fattening at a price of 8 lei/kg bodyweight.

Cheese processing within their own farm is economically inefficient because the production unit cost would be 25.09 lei per kg.

Regarding the relationship between incomes and expenses, profit can be achieved only under subsidies accessing.

C. Average subsistence farm is considered to be one of the small size (5 heads). Table 7 present the herd structure as it was indicated by in field analysis.

Table 7. Herd structure in a subsistence farm

Categoria de animale	Număr de capete
Female buffaloes for milk	5
Heifers	1
Bulls	
Female youth 0-3 months	2
Male youth 0-3 months	-
Female youth 3-6 months	-
Male youth 3-6 months	-
Female youth over 6 months	-
Youth male for fattening (over 6 months)	-

Within subsistence farms, staff costs are zero since work is non-quantified, unpaid default. Family members are running the daily activities of the farm, including field labor.

Table 8 and Figure 3 present the production cost structure of the products produced in a subsistence farm.

Table 8. Production cost structure of the products produced in a subsistence farm

Specification	Lei	Structure (% of total)
Fixed expenses	0	0.00
Staff expenses	0	0.00
Variable expenses	26780	100.00
Expenses for electricity	1200	4.48
Fuel expenses	1200	4.48
Expenses for feed	21340	79.69
Expenses for water	240	0.90
Veterinary assistance expenses	400	1.49
Supply and transportation expenses	600	2.24
Other expenses	1800	6.72
TOTAL EXPENSES	26780	100.00

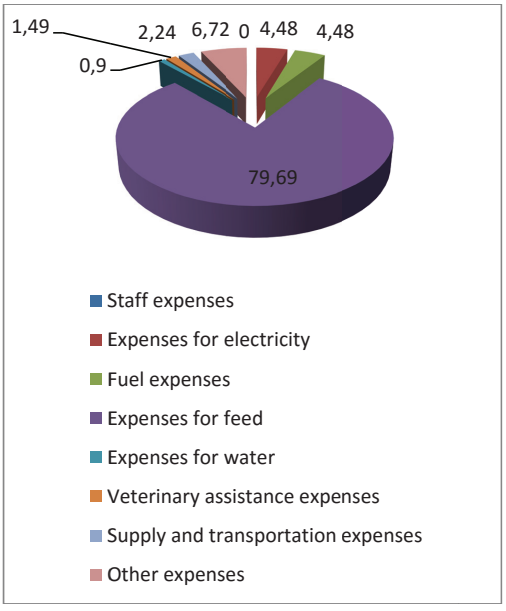

Figure 3. Production cost structure of the products produced in a subsistence farm

Estimated production costs on the analyzed farm are:

1. Fixed unit cost:

$$C_{uf} = \frac{Fixed\ expenses}{Production\ volume} = \frac{0}{5475} = 0\ lei\ per\ milk\ liter$$

2. Variable unit cost:

$$C_{uv} = \frac{Variable\ expenses}{Production\ volume} = \frac{26780}{5475} = 4.891\ lei\ per\ milk\ liter$$

3. Total unit cost:

$$C_{ut} = \frac{Production\ expenses}{Production\ volume} = \frac{26780}{5475} = 4.891\ lei\ per\ milk\ liter$$

We present in Table 9 profit calculation for analyzed farm.

Table 9. Profit calculation in a subsistence farm

INCOMES	✓ Telemea cheese: 1368.75 kg x 15 lei/kg = 20531.25 lei/year ✓ Male youth: 3 capete x 800 lei/cap = 2400 lei/year ✓ Subsidies: - 5 female for milk x 1393 lei/head = 6965 lei/year - 3 heads (other categories) x 575 lei/head = 1725 lei/year
	TOTAL INCOMES: 31621.25 lei/year
EXPENSES	✓ Expenses for electricity: 1200 lei/year ✓ Fuel expenses: 1200 lei/year ✓ Expenses for feed: 21340 lei/year ✓ Expenses for water: 240 lei/year ✓ Supply and transportation expenses: 600 lei/year ✓ Veterinary assistance expenses: 1800 lei/year ✓ Other expenses: 600 lei/year
	TOTAL EXPENSES: 26780 lei/year
BENEFIT	Total income - total expenses = 4841.25 lei
PROFIT TAX	774.6 lei
NET PROFIT	4066.65 lei

It is observed that for one liter of milk are necessary expenses amounting to 4.89 lei. It highlights the very high proportion of feed costs in total expenses for one liter of milk (79.7%) given that staff costs are zero.

As stated in the questionnaire, in subsistence farms the entire production is processed in Telemea cheese, which sells for 15 lei/kg. Also it offered for sale 3 heads of youth male for fattening at a price of 8 lei/kg bodyweight.

Cheese processing within subsistence farms is economically inefficient because the production unit cost would be 19.56 lei per kg.

Regarding the relationship between incomes and expenses, profit can be achieved in a

subsistence farm only under subsidies accessing.

CONCLUSIONS

Whatever the size of the farm, milk and Telemea cheese are produced under conditions of total economic inefficiency. Total unit cost higher than the selling price per unit of product makes profit impossible. Obviously, this statement refers only to the production of milk and cheese without discuss other salable production of the farm (youth for meat, breeding youth).

In all three analyzed cases, there is a high value of variable unit cost. This value is given, for the most part, by the expenses for feeding. It is known that the variable unit cost decreases as production volume increases (to a point). As a result, it appears advisable to increase the global production of milk at the farm level. This action should cover several aspects: a) increasing the number of animals (at a certain level can be an economically non-viable solution, due to the growth of investments); b) increase the production potential by developing animal breeding or active conservation programs; c) improving environmental conditions (maintenance and feeding) in order to fully exploit the genetic potential of animals.

Economic losses in the three analyzed cases are determined by the fact that the sale price is well below the variable unit cost, and can not diminish losses due to staff costs.

Minimize unit cost of production should be permanent objective of farms whereas in relation to the price at which products are sold, determine the level of profit.

Increasing the volume and quality of milk production and diversification of products offered for sale are efficient ways to minimize the cost per unit of product. Diversification of production at farm level should be a strategic objective of buffaloes exploitation in Romania. Meat and meat products (beef jerky, dried raw salami, sausages, liver pate, etc.) and diversification of products from milk (precursor of Mozzarella, milk for coffee, plain and fruit yogurt, buffalo milk desserts, sweet cream for whipped cream, Mediterranean dishes (soak cheese in herbs and olive oil, etc.) may be viable long-term solutions. But these actions require, on the one hand, effective strategies in the medium and long term, developed by local authorities, on the other hand farmers association.

ACKNOWLEDGEMENTS

This research work was financed from Project PNCDI II No169/2014.

REFERENCES

Cogălniceanu D., 1999. Managementul capitalului natural. Ars Docendi Publishing House, Bucharest, 5-48.

Grosu H., 2003. Programe de ameliorare. AgroTehnica Publishing House, Bucharest, Chap. 3, 29-30.

Oancea M., 1999. Tratat de management în unitățile agricole. Ceres Publishing House, Bucharest, 50-160.

Popa R., 2009. Programe de ameliorare. Printech Publishing House, Bucharest, Chap. 2, 29-30.